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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/049,672	04/30/2002	Yasushi Kurata	566.411991X00	7706

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EXAMINER	
DEO, DUY VU NGUYEN	
ART UNIT	**PAPER NUMBER**
1765	

DATE MAILED: 08/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/049,672	KURATA ET AL.	
	Examiner	Art Unit	
	DuyVu n. Deo	1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 June 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *25-33,35,38,40-57 and 59-100* is/are pending in the application.

4a) Of the above claim(s) *40,52,53 and 73-84* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *25-33,35,38,41-51,54-57,59-72 and 85-100* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *40, 52, 53, 73-84* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claim 26-33, 35, 41, 50-51, 56, 57, 62-64, 69-72, 89-92, 97-100 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. (US 6,171,352).

Lee describes a polishing composition comprising: an oxidizing agent such as H2O2 (col. 3, line 5; col. 6, line 44); a protective-film-forming agent of benzotriazole and/or its derivatives (col. 4, line 19); an organic acid of glycolic acid (col. 3, line 23); deionized water (col. 4, line 11); 1-15 % wt of abrasive that can be any commercially available such as silica and alumina (claimed colloidal silica and alumina) (col. 2, line 66-col. 3, line 2; col. 3, line 67-col. 4, line 1); pH is from 1-6 (col. 4, line 31-40) (this would include claimed pH of 3 or less); and the oxidizing agent concentration is from 1-15 % by weight (col. 2, line 64), this would include concentration within claimed 0.01-3 %wt or 0.01-1.5 %wt. Unlike claimed invention, Lee doesn't suggest the oxidizing concentration is from 0.01-3 or 0.01-1.5 wt % or the pH is of 3 or less. However, the oxidizing concentration and the pH are a result-effective variables because Lee shows there are concentration and pH ranges. Therefore, it would have been obvious for one skilled in the art to determine the oxidizing concentration and the pH through routine experimentation in order to

provide an optimum concentration and the pH for the polishing composition depending on the material being polishing.

Referring to claims 27, 28, the composition further comprises polyacrylic acid copolymer or salts thereof (col. 2, line 47). This would read on claimed water-soluble polymer.

Referring to claim 35 Lee describes the method for polishing material including Cu and Ta (col. 4, line 38; col. 7, line 54).

Referring to claims 38, 51, 63, Lee's composition would have the polishing-rate ratio between different materials disclosed in claims 37, 38, 51, 52. Support for this presumption is found by the facts that the composition includes the same compounds with the same concentrations as that of the claims. The burden is upon the applicant to prove otherwise. *In re Fitzgerald*, 205 USPQ 594.

3. Claims 25, 38, 42-49, 54-55, 59-61, 65-68, 85-88, 93-96 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee as applied to claim 62 above, and further in view of Hardy et al. (US 6,238,592).

Referring to the average size of the abrasive, Hardly describes a average particle size of 50 nm or less (col. 9, line 65-col. 10, line 5). It would have been obvious for one skill in the art to determine the particle size in light of Hardly because Hardly further describes other processing parameters, such as average size of the abrasive, that is silent in Lee.

Even though applied prior art above does not describe standard deviation of the particle size distribution in a value of more than 5nm. It would have been obvious for one skill in the art

to determine the standard deviation of the particle size distribution through test runs in order to provide a slurry for the polishing with a reasonable expectation of success.

Referring to claims 59, 65, 85, 93 Hardly further teaches that the polishing medium can contain abrasive or the abrasive can be fixed to abrasive article (col. 10, line 3-7). In the latter case, the polishing medium would not contain abrasive grains. This shows that either way would be equivalent and obvious at the time of the invention.

Referring to claims 54-57, even though applied prior art doesn't describe the pH of the oxidizing agent; however, it would be obvious to one skilled in the art that oxidizing agent pH can be any value as long as it provides the final pH of the slurry within the range as suggested by the applied prior art.

Response to Arguments

4. In response to applicant's arguments, the recitation of a polishing medium for CMP, adapted to polish a barrier layer of Ta, Ta alloy, or a Ta compound, or the recitation of a polishing medium for CMP of a surface having at least one of Ta, Ta alloy and a Ta compound has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

5. In response to applicant's argument that the polishing medium is for polishing Ta, Ta alloy and Ta compound, a recitation of the intended use of the claimed invention must result in a

structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 370 F.2d 576, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 312 F.2d 937, 939, 136 USPQ 458, 459 (CCPA 1963).

Election/Restrictions

6. Newly submitted claims 40, 52, 53, 73-84 directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: the polishing medium can be used for other purpose such as cleaning or polishing a dielectric material.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 40, 52, 53, 73-84 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Oath/Declaration

7. The examiner has not found the enclosed Declaration under 37 CFR 1.132. Even if the Declaration shows the unexpected result as argued by the applicant; however, it would not be persuasive because it addresses limitations that are just an intended use of the polishing medium or cited in the preamble.. Please see above arguments.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

9. Claims 25-33, 35, 38, 41-51, 54-57, 59-72, 85-100 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. It is unclear wherein the specification teaching that the polishing medium is for a tantalum compound.

10. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

11. Claims 25-33, 35, 38, 41-51, 54-57, 59-64, 85-92 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The preamble describes the a polishing medium for CMP, adapted to polish a barrier layer of Ta, Ta alloy or a Ta compound, and yet for a conductor of Cu, Cu alloy, or Co oxide. It is unclear what is this polishing medium is for, the Ta materials or Cu materials or both. Also it is unclear by "adapted to polish..."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DuyVu n. Deo whose telephone number is 571-272-1462. The examiner can normally be reached on 6:00-2:30 Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571-272-1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

**Primary Examiner
Duy-Vu N. Deo
8/8/05